

with 1 to 2 inches between rows, covering lightly and maintaining the flats at 72°F. Keep the medium moist but not overly wet by misting. A plastic “greenhouse top” or plastic wrap draped over the flat will ensure high humidity, but don’t forget to vent the flats if placed in direct sunlight. Germination usually occurs in 7 to 14 days, but may be delayed and irregular. After germination, reduce the humidity, keep seedlings well ventilated and somewhat dry, but never allow the seedlings to dry out completely. The young seedlings must be carefully pricked out and transplanted into larger containers, such as 4 inch pots. Grow the young geraniums with 72° F days and 65°F nights. Supply supplemental light from fluorescent tubes to give 14 to 18 hours of light per day. Fertilize every two weeks with a water soluble plant food from the time of germination until planting outdoors. Most geraniums will flower in 95 to 110 days from germination.

Overwintering Geraniums - Although geraniums can be overwintered, this can result in carry-over of diseases and insect pests from year to year; so it may be best to purchase new plants each spring. Gardeners wishing to overwinter their geraniums can try several techniques: Take cuttings in the fall and keep the small, potted plants on a windowsill with a bright, sunny southern exposure during the winter. Large geraniums can be dug from the garden before the first frost and planted in pots large enough to accommodate their root system. Cut the top of the plant back to 6 inches in height, and place in a sunny area such as a heated porch. An old method of overwintering geraniums is to dig the plants before the first frost, knock the soil from their roots, and hang the plants upside down in a cool, moist basement with 80% humidity and temperatures between 35-45 degrees F where they will not freeze. If plants begin to dry out, periodically take them down and soak the roots in water. In spring, take the plants down, cut off 1/2 to 3/4 of the top growth, and replant outdoors.

Disease Problems - For current disease control recommendations consult the county Agricultural Extension Agent, or consult the *N. C. Agricultural Chemicals Manual* on the internet at <<http://ipmwww.ncsu.edu/agchem/agchem.html>> and always follow label directions.

-Bacterial Leaf Spot/Blight (*Xanthomonas campestris* pv. *pelargonii*) causes spotting of the leaves, leaf drop and black rot of the stems. The disease is favored by warm, humid weather, crowding of plants and planting infected stock. To control, pick off and discard all leaves with spots. Avoid splashing water around plants. Watering by soaker hose to keep plants dry, watering in the morning so foliage can dry off, and sprays of copper fungicides are effective.

-Alternaria Leaf Spot (*Alternaria tenuis*) is a fungal leaf spot resembling bacterial leaf spot. The control measures are the same as for bacterial leaf spot.

-Black Leg (*Fusarium* sp.) and Black Stem Rot (*Pythium splendens*) occur on cuttings and occasionally on full grown plants. The rot starts at the base of the cutting and progresses upward, blackening the stem and defoliating the plant. To control, take cuttings only from healthy plants which have been kept dry, root in sterilized rooting medium, and employ sanitation with a bleach solution to sterilize cutting tools and flats. Fungicidal drenches may help control the spread from plant to plant.

-Botrytis Gray Mold, Leaf Spot and Blossom Blight (*Botrytis cinerea*) is very common during cool, moist weather. Water soaked lesions occur first, which later dry out and are covered with a grayish brown mass of fungal growth. When the petals are infected they become discolored, wilt and fall off. To control, remove old flowers and do not crowd plants in the landscape to insure good air circulation. Plant in full sunlight, keep plants on the dry side, and use fungicidal sprays if the disease is severe.

-Rust (*Puccinia pelargonii-zonalis*) causes powdery, golden brown pustules on the leaves, petioles and stems. The leaves turn yellow and drop prematurely. To control, avoid purchasing infected plants, and spray with fungicides if the disease is found in the landscape.

-Virus diseases can be transmitted from infected mother plants to cuttings made from these stock